

AMENDMENTS TO THE CLAIMS

Please cancel claims 1-27 and 31-32

28. (Currently Amended) An apparatus for electrolyzing water for the production of hydrogen, oxygen and heat, which comprises:

(i) an electrochemical cell having an isotopic hydrogen storage cathode, an electrically conductive anode and a compartment for holding an ionically conducting electrolyte comprising water, and

~~(ii) means for applying to said cathode and said anode at least two alternating voltage regimes, a first cell voltage regime consisting of a voltage ranging from about 1 to about 10 volts, and a second cell voltage regime consisting of at least one voltage pulse ranging from 2 times to 1,000 times the voltage of said first cell voltage regime, the total duration of said voltage pulse ranging from about 0.5 nanoseconds to 0.10 seconds~~

a pulsed power supply for said electrochemical cell comprising means for generating a repeating sequence of voltages across said anode and said cathode, each said sequence including a first cell voltage regime consisting of a voltage sufficient to enhance cathodic absorption of hydrogen and a second voltage regime consisting of at least one voltage pulse which is at least two time the voltage of the first cell voltage regime in magnitude with a duration no greater than 0.10 seconds.

29. (Currently Amended) The apparatus of Claim 28 wherein ~~said means for applying an alternating voltage regime comprises means for providing a train of timing pulses, means for counting and decoding said timing pulses, and means for generating sequences of pulsed potentials at predetermined times in response to said counted and decoded pulses~~

voltage of said first cell voltage regime generated by said pulsed power supply ranges from about 1 to about 10 volts, and the voltage

pulse of said second cell voltage regime ranges from 2 to 1000 times the voltage of said first cell voltage regime, and the total duration of said second voltage pulse ranges from about 0.5 nanoseconds to about 0.10 seconds.

30. **(Currently Amended)** The apparatus of Claim ~~29~~ 28 wherein said ~~means for providing alternating pulsed potentials comprises a circuit which generates a periodic potential comprising a constant current or positive potential for a predetermined time interval, followed by a constant current or negative potential for a predetermined time interval, followed by a brief high voltage pulse for a predetermined time interval~~ pulsed power supply is operatively arranged to dovetail said second cell voltage regime onto said first cell voltage regime.

33. **(New)** The apparatus of Claim 28, wherein said pulsed power supply is operatively arranged to superimpose said second cell voltage regime onto said first cell voltage regime.

34. **(New)** The apparatus of Claim 29, wherein said pulsed power supply is operatively arranged to dovetail said second cell voltage regime onto said first cell voltage regime.

35. **(New)** The apparatus of Claim 29, wherein said pulsed power supply is operatively arranged to superimpose said second cell voltage regime onto said first cell voltage regime.

36. **(New)** The apparatus of Claim 28, wherein each said sequence of said pulsed power supply further includes a positive voltage sufficient for cleaning said anode.

37. **(New)** The apparatus of Claim 28, wherein each said sequence of said pulsed power supply further includes a positive voltage sufficient for cleaning said cathode.

38. (New) The apparatus of Claim 28, wherein said pulsed power supply is operatively arranged to re-equilibrate the cathode in a region of zero potential.

39. (New) The apparatus of Claim 29, wherein said pulsed power supply is operatively arranged to re-equilibrate the cathode in a region of zero potential.

40. (New) The apparatus of Claim 36, wherein said pulsed power supply is operatively arranged to apply a negative potential for further cathodic absorption of hydrogen.

41. (New) The apparatus of Claim 37, wherein said pulsed power supply is operatively arranged to apply a negative potential for further cathodic absorption of hydrogen.

42. (New) An apparatus for electrolyzing water for the production of hydrogen, oxygen and heat, which comprises:

(i) an electrochemical cell having an isotopic hydrogen storage cathode, an electrically conductive anode and a compartment for holding an ionically conducting electrolyte comprising water, and

(ii) a pulsed power supply for said electrochemical cell, comprising:

a triple power supply having a first low voltage direct current supply, a second low voltage direct current supply, and a third high voltage direct current supply;

an oscillator coupled to and powered by said second low voltage direct current supply, operatively arranged to provide a train of timing pulses;

a binary counter operatively arranged to receive said timing pulses from said oscillator;

a decoder coupled to said binary counter and operatively arranged to count said timing pulses; and,

a current generator coupled to and controlled by said decoder, said current generator operatively arranged to provide oscillating pulsed potentials to said anode and said cathode.

43. (New) The apparatus of Claim 42 wherein said oscillating pulsed potentials comprise a repeating sequence of voltages, each said sequence including a first cell voltage regime consisting of a voltage sufficient to enhance cathodic absorption of hydrogen and a second voltage regime consisting of at least one voltage pulse which is at least two times the voltage of the first cell voltage regime in magnitude with a duration no greater than 0.10 seconds.

44. (New) The apparatus of Claim 43 wherein the voltage of said first cell voltage regime ranges from about 1 to about 10 volts, and the voltage pulse of said second cell voltage regime ranges from 2 to 1000 times the voltage of said first cell voltage regime, and the total duration of said second voltage pulse ranges from about 0.5 nanoseconds to about 0.10 seconds.

45. (New) The apparatus of Claim 42 wherein said anode and cathode are connected via electronic switching circuitry to all three of said power supplies in order that oscillating potentials of varying polarity may be impressed across said anode and cathode over time.

46. (New) The apparatus of Claim 42 wherein said first low voltage direct current power supply is a 12 Volt power supply.

47. (New) The apparatus of Claim 42 wherein the second low voltage direct current power supply is a 12 Volt power supply.

48. (New) The apparatus of Claim 42 wherein the third high voltage direct current power supply is a 1000 Volt power supply.